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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/828,625	04/21/2004	Neelesh B. Mehta	MERL-1565	5829

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Patent Department  
Mitsubishi Electric Research Laboratories, Inc.  
201 Broadway  
Cambridge, MA 02139

EXAMINER

GESESSE, TILAHUN

ART UNIT	PAPER NUMBER
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2684

DATE MAILED: 09/23/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/828,625

Applicant(s)

MEHTA ET AL.

Examiner

Tilahun B. Gesesse

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 21 April 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-8 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-4 and 6-8 is/are rejected.
- 7) ☒ Claim(s) 5 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>4/21/04 &amp; 8/8/05</u> | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Double Patenting*

1. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1 through 8 provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1 through 10 of copending Application No. 10/209,306. Although the conflicting claims are not identical, they are not patentably distinct from each other because the conflicting claims are broadly recited than claims of the present application. The scope of the conflicting

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claims are broader than the claims of the instant application, the conflicting claims covers the claims of the instant application.

The subject matter claimed in the instant application is fully disclosed in the referenced copending application and would be covered by any patent granted on that copending application since the referenced copending application and the instant application are claiming common subject matter, as follows: " transmitting a stream of data symbols in a multiple-input/multiple- output wireless communications system including M pairs of transmitting antennas, comprising: demultiplexing the stream of data symbols into M sub-streams; adaptively modulating and coding each sub-stream to a maximum data rate while achieving a predetermine performance on an associated channel used to transmit the sub-stream; and space-time transmit diversity encoding each coded sub-stream"

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

### ***Claim Rejections - 35 USC § 102***

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1,4,6,8 are rejected under 35 U.S.C. 102(e) as being anticipated by Tujkovic et al U. S. Patent No. 6,934,320 "Tujkovic"

Claim 1, Tujkovic teaches a method for transmitting an input stream of data symbols in a multiple- input/multiple-output wireless communications system (column 1, lines 44-62 and figure 1), comprising:

Tujkovic teaches demultiplexing the input stream into M sub-streams (column 7, lines 22-41 and column 7, lines 66-column 8, lines 15 and figures 2 and 4).

Tujkovic teaches adaptively modulating and coding each of the M sub-streams to a coded sub-stream (column 3, line 37-column 5, lines 59 and figure 1).

Tujkovic teaches space-time transmit diversity encoding a first of the M coded sub-streams into two space-time transmit diversity encoded sub-streams, one space-time transmit diversity encoded sub-stream to be transmitted by a corresponding one of two transmit antenna (column 7, lines 43-65), and

Tujkovic teaches transmitting directly each other coded sub-stream by a corresponding single transmit antenna (column 7, lines 63-65).

Claim 4. Tujkovic teaches all limitations as explained in above in claim 1. Tujkovic further teaches coding each sub-stream, interleaving each coded sub-stream; and symbol mapping each interleaved sub-stream ((column 3, line 37-column 5, lines 59 and figure 1).

Claim 6. Tujkovic teaches all limitations as explained in above in claim 1. Tujkovic further teaches space-time transmit diversity encoding each of a subset of the M coded sub-streams into two space-time transmit diversity encoded sub-streams, one

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space- time transmit diversity encoded sub-stream to be transmitted by a corresponding one of two transmit antenna and transmitting directly each other of the M coded sub-stream not included in the subset by a corresponding single transmit antenna (column 2, lines 56-68 and column 3, lines 36-column 5, lines 59 and figure 1).

Claim 8. Tujkovic teaches an apparatus for transmitting an input stream of data symbols in a multiple- input/multiple-output wireless communications system (column 2, lines 56-68 and column 3, lines 36-column 5, lines 59 and figure 1), comprising:  
Tujkovic teaches M+1 transmit antennas (column 5, lines 43-59).

Tujkovic teaches a demultiplexer configured to demultiplex the input stream into M sub-stream: M means for adaptively modulating and coding each of the M sub-stream: to a coded sub-stream (column 7, lines 22-41) means for space-time transmit diversity encoding a first of the M coded sub-stream into two space-time transmit diversity encoded sub-streams, one space- time transmit diversity encoded sub-stream to be transmitted by a corresponding one of two transmit antenna (column 7, lines 42-65 and figure 3); and

Tujkovic teaches means for transmitting directly each other M-1 coded sub-stream by a corresponding single transmit antenna (column 5, lines 43-59).

### ***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 2-3, and 7 rejected under 35 U.S.C. 103(a) as being unpatentable over Tujkovic in view of Walton et al "Walton" '247.

Claim 2. Tujkovic teaches all limitations as explained in above in claim 1.

Tujkovic further teaches feeding back, from a receiver, channel conditions of an associated channel for each transmit antenna (column 7, line 66-column 8, lines 15 and figures 5-11)

Tujkovic does not teach selecting a maximum data rate. However, Walton hints or indicates selecting a maximum data rate [see paragraph 0051]. Tujkovic and Walton both teaches MIMO and STTD transmission and receiving technique, then , it would have been obvious to an artisan of ordinary skill in the art at the time of the invention was made to select a maximum data rate , as taught by Walter, in order to avoid lower data rate which causes to interfere or corrupt data.

Claim 3. Tujkovic teaches all limitations as explained in above in claim 2.

Tujkovic further teaches the channel conditions measure a signal to interference plus noise ratio of the output streams received in the receiver (column 7, line 66-column 8, lines 15 and figures 5-11).

Claim 7. Tujkovic teaches all limitations as explained in above in claim 2.

Tujkovic further teaches selecting the number M of sub-streams based on the channel condition (column 7, line 66-column 8, lines 15 and figures.5-11).

***Allowable Subject Matter***

6. Claim 5 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: the prior art does teach multiplying each of the plurality of demultiplexed output streams by an orthogonal variable spreading factor; adding the demultiplexed output streams, for each output stream, after multiplication into a summed output stream corresponding to each output stream; and multiplying each summed output stream by a scrambling code.

***Conclusion***

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Chung (EP 1207645) teaches a wireless communication system using multiple antennas at the transmitter and multiple antennas at the receiver (see abstract).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tilahun B Gesesse whose telephone number is 571-272-7879. The examiner can normally be reached on flex.



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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nay Maung can be reached on 571-272-7882.

the Central FAX Number will change to 571-273-8300. This new Central FAX Number is the result of relocating the Central FAX server to the Office's Alexandria, Virginia campus.

Most facsimile-transmitted patent application related correspondence is required to be sent to the Central FAX Number. To give customers time to adjust to the new Central FAX Number, faxes sent to the old number (703-872-9306) will be routed to the new number until September 15, 2005. After September 15, 2005, the old number will no longer be in service and 571-273-8300 will be the only facsimile number recognized for "centralized delivery".

**CENTRALIZED DELIVERY POLICY:** For patent related correspondence, hand carry deliveries must be made to the Customer Service Window (now located at the Randolph Building, 401 Dulany Street, Alexandria, VA 22314), and facsimile transmissions must be sent to the Central FAX number, unless an exception applies. For example, if the examiner has rejected claims in a regular U.S. patent application, and the reply to the examiner's Office action is desired to be transmitted by facsimile rather than mailed, the reply must be sent to the Central FAX Number.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

9/16/05  
TILAHUN GESESSE  
PRIMARY EXAMINER